

PRICE \$1.00



Assembling
and Using Your...

Heathkit

HANDITESTER KIT

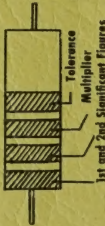
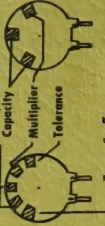

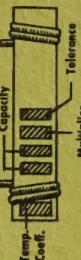
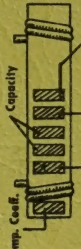
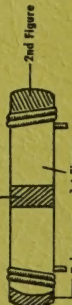
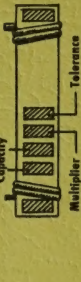

MODEL M-1

HEATH COMPANY

A Subsidiary of Daystrom Inc.

BENTON HARBOR, MICHIGAN

STANDARD COLOR CODE — RESISTORS AND CAPACITORS

<p>AXIAL LEAD RESISTOR</p> <p>Brown — Insulated Black — Non-insulated</p>  <p>1st and 2nd Significant Figures Multiplier Tolerance</p> <p>Wire wound resistors have 1st digit band double width</p>	<p>INSULATED UNINSULATED Color</p> <p>BLACK BROWN RED ORANGE YELLOW GREEN BLUE VIOLET GRAY WHITE</p> <p>FIRST RING BODY COLOR First Figure</p> <p>0 1 2 3 4 5 6 7 8 9</p> <p>SECOND RING END COLOR Second Figure</p> <p>0 1 2 3 4 5 6 7 8 9</p> <p>THIRD RING DOT COLOR Multiplier</p> <p>None 0 00 000 0,000 00,000 000,000 0,000,000 00,000,000 000,000,000</p>	<p>DISC CERAMIC RMA CODE</p>  <p>5-Dot Capacity Multiplier Tolerance Temp. Coeff.</p>
<p>RADIAL LEAD DOT RESISTOR</p>  <p>1st Figure 2nd Figure Multiplier Tolerance</p>	<p>5-DOT RADIAL LEAD CERAMIC CAPACITOR</p>  <p>Temp. Coeff. Capacity Multiplier Tolerance</p>	<p>EXTENDED RANGE TC CERAMIC HICAP</p>  <p>Temp. Coeff. Capacity Multiplier Tolerance</p>
<p>RADIAL LEAD (BAND) RESISTOR</p>  <p>1st Figure 2nd Figure Multiplier Tolerance</p>	<p>BY-PASS COUPLING CERAMIC CAPACITOR</p>  <p>Capacity Multiplier Voltage (Opt.) Tolerance</p>	<p>AXIAL LEAD CERAMIC CAPACITOR</p>  <p>Temp. Coeff. Capacity Multiplier Tolerance</p>

The standard color code provides all necessary information required to properly identify color coded resistors and capacitors. Refer to the color code for numerical values and the zeroes or multipliers assigned to the colors used. A fourth color band on resistors determines tolerance rating as follows: Gold = 5%, silver = 10%. Absence of the fourth band indicates a 20% tolerance rating.

The physical size of carbon resistors is determined by their wattage rating. Carbon resistors most commonly used in Heath-kits are $\frac{1}{2}$ watt. Higher wattage rated resistors when specified are progressively larger in physical size. Small wire wound resistors $\frac{1}{2}$ watt, 1 or 2 watt may be color coded but the first band will be double width.

Range DC Volts.....	Full scale 10-30-300-1,000 and 5,000 Volts
Range AC Volts.....	Full scale 10-30-300-1,000 and 5,000 Volts
Range Ohmmeter.....	0-3,000 Ohms 30 Ohms Center 0-300,000 Ohms 30 Ohms Center
Range Milliampere.....	0-10 MA 0-100 MA
Meter Movement.....	400 Microampere 3"
AC Rectifier.....	Dual half wave
Accuracy.....	1% divider and calibrating resistors provided Meter movement 2% of full scale
Case.....	Streamline Bakelite
Ohmmeter Battery.....	Burgess No. 1 Unicell Flashlight Battery

- ~~(X)~~ On lower and middle decks connect bare wire between lugs #1-#2-#3-#4 and #9-#10-#11-#12.
- ~~(X)~~ On upper deck connect bare wire between lugs #2-#11, lugs #3-#10 and between lugs #4-#9. Use spaghetti covering.
- ~~(X)~~ On upper deck connect 700K Ω 1 watt resistor between lug #2 and lugs #12 and #1 which are connected together.
- ~~(X)~~ On upper deck connect 270K Ω resistor between lug #10 and #11.
- ~~(X)~~ On upper deck connect 20K Ω resistor between lug #3 and #4.
- ~~(X)~~ Between lower and middle deck connect 2516 Ω resistor between dummy lug #6 on lower deck and long lug under lug #11 on middle deck. (This resistor may be placed inside the switch alongside the shaft.)
- ~~(X)~~ On lower deck connect 29 Ω resistor between dummy lug #6 and lug #8.
- ~~(X)~~ Connect 9750 Ω resistor between lug #4 on upper deck and lug #4 on middle deck.
- ~~(X)~~ Connect 417 Ω resistor between lug #3 on middle deck and lug #3 on lower deck.
- ~~(X)~~ Install 9500 Ω resistor between lug #9 on upper deck and dummy lug #7 on lower deck.
- ~~(X)~~ Install 7000 Ω resistor between lug #10 on middle deck and lug #10 on lower deck.
- ~~(X)~~ Connect 2.51 Ω resistor between long lug #5 on lower deck and lug #5 on upper deck.
- ~~(X)~~ Connect a bare wire between middle deck lug #5 and upper deck lug #5.
- ~~(X)~~ Connect 26 Ω resistor between long lug #5 on lower deck and lug #6 on upper deck.
- ~~(X)~~ Connect a bare wire between middle deck lug #6 and upper deck lug #6.

Note: When soldering connection avoid excessive use of rosin flux and do not allow a flux flooding condition to occur between switch terminals.

- ~~(X)~~ Solder all connections except the following: Middle deck, lug #9 and long lug under #11; lower deck, long lug #5, dummy lugs #6 and #7 and lug #9.

FINAL ASSEMBLY

- ~~(X)~~ Mount the wired switch through bracket hole and cover; fasten securely with control lock-washer and control nut.
- ~~(X)~~ Wire the rectifier to the switch by connecting the red wire to lug #9 on middle deck, the center wire to dummy lug #7 on lower deck; the remaining wire to lug #9 on the lower deck. Solder all these connections.
- ~~(X)~~ Wire the control and the meter to the switch by connecting meter + to long lug under #11 on middle deck; meter - and outside contact on control to long contact lug under #8 on the lower deck; center contact on control to lugs #7 and #8 connected together on the middle deck. Solder these connections.

- (X) Wire the battery contacts to the switch by connecting the + lug to dummy lug #6 on the lower deck; the - lug to lugs #7 and #8 connected together on the upper deck. Solder these connections.
- (X) Wire the banana jacks to the switch by connecting the "common" jack to the long lug #5 on lower deck; the middle "V-O-MA" jack to the long lug below #3 on the upper deck; and the "5,000 V" jack to the long lug below #12 on the upper deck using two resistors, 2 megohm 2 watt in series, each covered with a large piece of spaghetti as shown in pictorial. Solder these connections.
- () Install flashlight cell observing polarity (the center contact is +) and fasten the knob on the selector switch. It may be necessary to slightly alter the switch mounting so that the pointer knob will line up with panel markings.
- () Slip the completed unit into the case and fasten with the four long screws.
- () Assemble the test leads using the black sleeve and banana plug assembly to the black test lead, solder the alligator clip to the remaining end.
- () Assemble the red sleeve and banana plug assembly to the red test lead and fasten the red test prod to the remaining end of the lead.
- () With completed instrument in horizontal position, check mechanical zero position of meter pointer. If adjustment is required turn the small black screw located just below scale opening. Tap meter lightly during adjusting procedure. For maximum accuracy always use meter in horizontal position.

USE

TO MEASURE D. C. (A. C.) VOLTAGE

Plug black test lead into "Com" jack.
 Plug red test lead into "V-O-MA" jack.
 Set selector to 1,000 DCV (ACV).
 Connect black test lead clip to negative (or common) on source under test.
 Touch red test prod to positive (or hot) on source under test.
 If reading is less than 300 volts, turn selector to 300 volts.
 If reading is less than 30 volts, turn selector to 30 volts.
 If reading is less than 10 volts, turn selector to 10 volts.

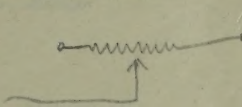
Making this procedure a habit will prevent overload and resultant damage.

TO MEASURE D. C. (A. C.) VOLTAGE BETWEEN 1,000 AND 5,000 VOLTS

CAUTION--HIGH VOLTAGES MAY BE DANGEROUS

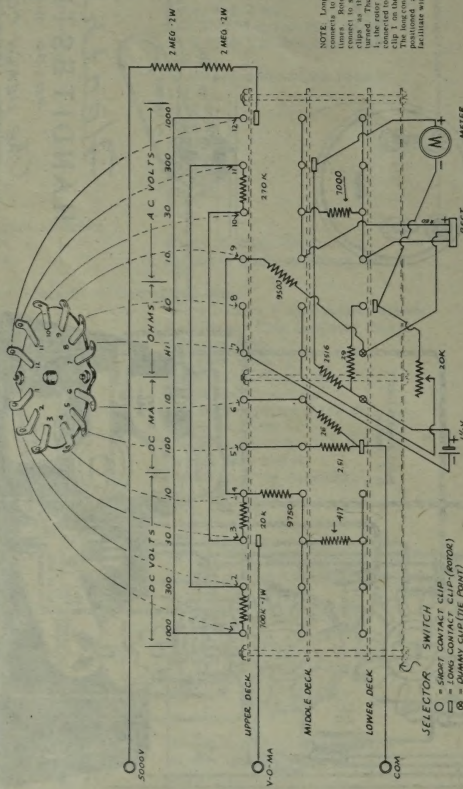
Plug black test lead into "Com" jack.
 Plug red test lead into "5,000 V" jack.
 Set selector switch to 1,000 DCV (ACV):
 With source turned off, connect black test lead clip to negative (or cold) and red test prod to positive (or hot) on source under test.
 Without touching test leads on instrument, turn source on and observe reading.
 Turn off source and observe reading drop back to zero, then disconnect the leads.

Making this procedure a habit may prevent serious accidents.



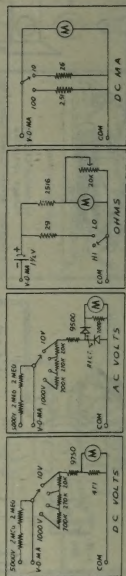
M-1 HANDITESTER PARTS LIST

PART No.	PARTS Per Kit	DESCRIPTION
Precision Resistors		
2-6B	2	2 megohm 2 watt
2-18	1	2.51 Ω (red-green-gold-brown)
2-20	1	26 Ω (red-blue-black-brown)
2-20A	1	700 K Ω
2-21	1	29 Ω (red-white-black-brown)
2-27	1	417 Ω
2-32	1	2516 Ω
2-34	1	7000 Ω
2-36	1	9500 Ω
2-37	1	9750 Ω
2-38	1	20 K Ω
2-43	1	270 K Ω
Controls-Switches		
10-24	1	20 K Ω Hearing Aid Control
63-24	1	3 Pole 12 Position Rotary Switch
Knobs-Plugs-Panel Connectors-Wire		
70-2	1	Black Banana Plug Insulator Sleeve
70-3	1	Red Banana Plug Insulator Sleeve
260-1	1	Alligator Clip
340-2	1	#20 Bare Wire 12"
341-1	1	length Black Test Lead
341-2	1	length Red Test Lead
344-1	1	roll Hook-up Wire 2 1/2 Ft.
346-1	1	length Spaghetti 8"
346-3	1	length Spaghetti 4"
437-1	3	Banana Jack Insert
438-M8	2	Sleeve and Plug Assembly
439-1	1	Red Test Prod
462-M11	1	Pointer Knob
Hardware		
250-1	1	#2 5/16 x 1/8" Self Tapping Screw
250-5	4	#4-48 x 2 1/8" Fillister Head Machine Screw
250-30	2	Banana Plug Screw
252-7	1	#3/8-32 x 1/8" Control Nut
252-10	1	Speed Nut
252-11	2	#1-72 Control Nut
253-3	2	Fibre Flat Washer
253-7	2	Fibre Shoulder Washer
254-5	1	Thin Control Lockwasher
Miscellaneous		
57-7	1	Dual Half Wave Meter Rectifier
100-M13	1	Battery Holder
204-M22	1	Control Bracket
407-5	1	400 μ a Meter with Cover
408-2	1	Case
418-1	1	1 1/2 Volt Type C Flashlite Battery

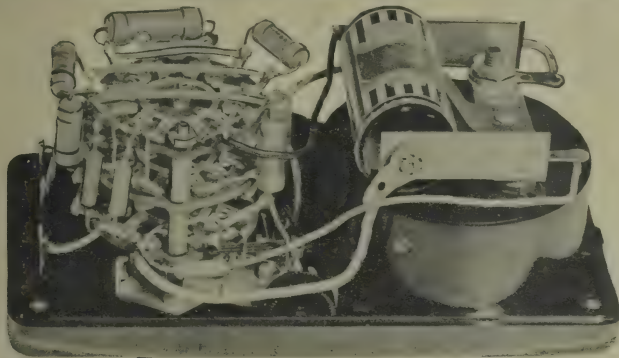
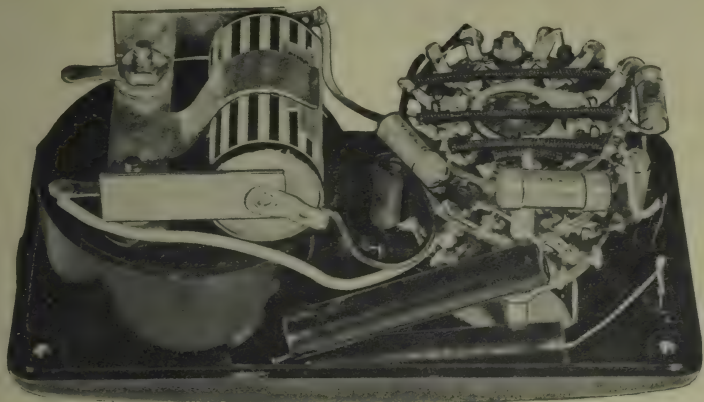


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*The HEATH COMPANY
BENTON HARBOR, MICH.*



Heathkit HANDITESTER KIT MODEL M-1



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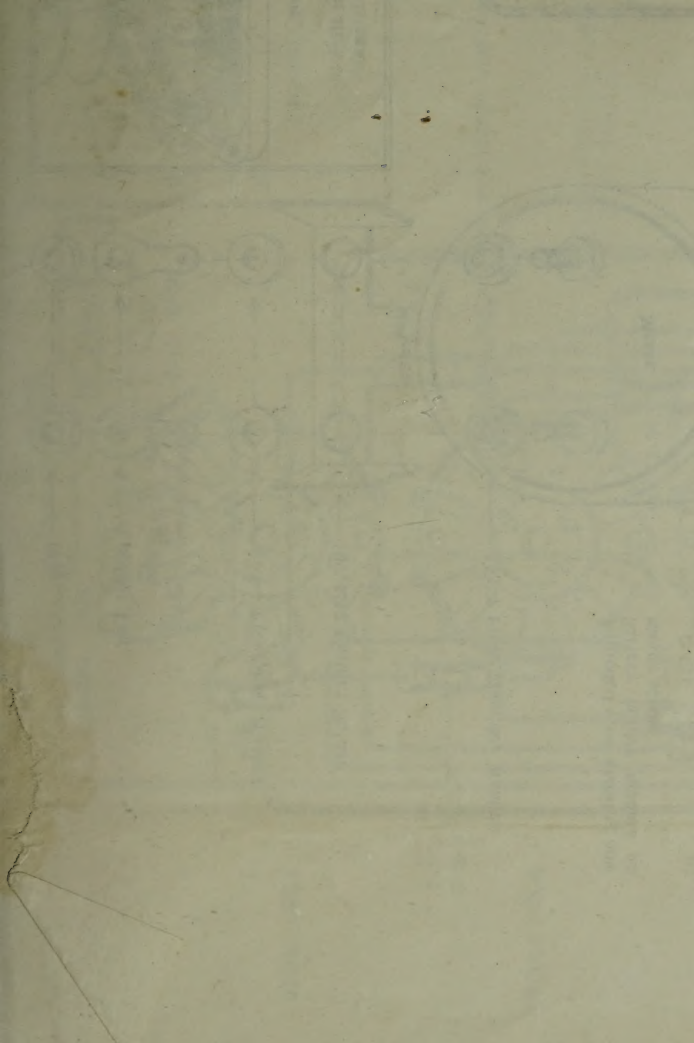
Notes

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THE WORLD'S FINEST ELECTRONIC EQUIPMENT IN KIT FORM

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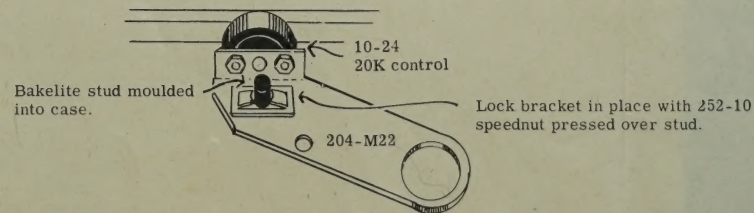
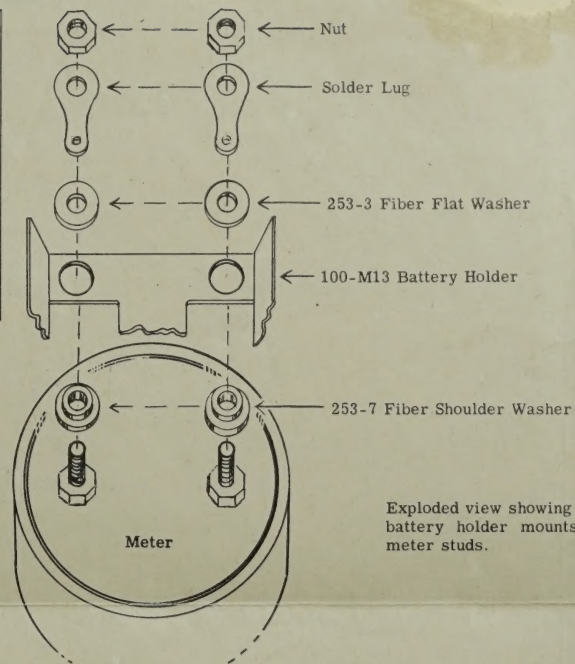
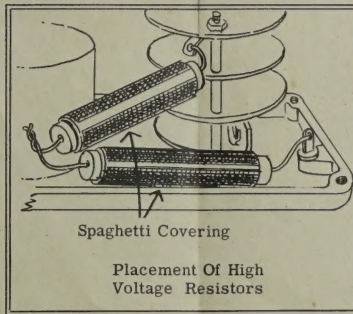
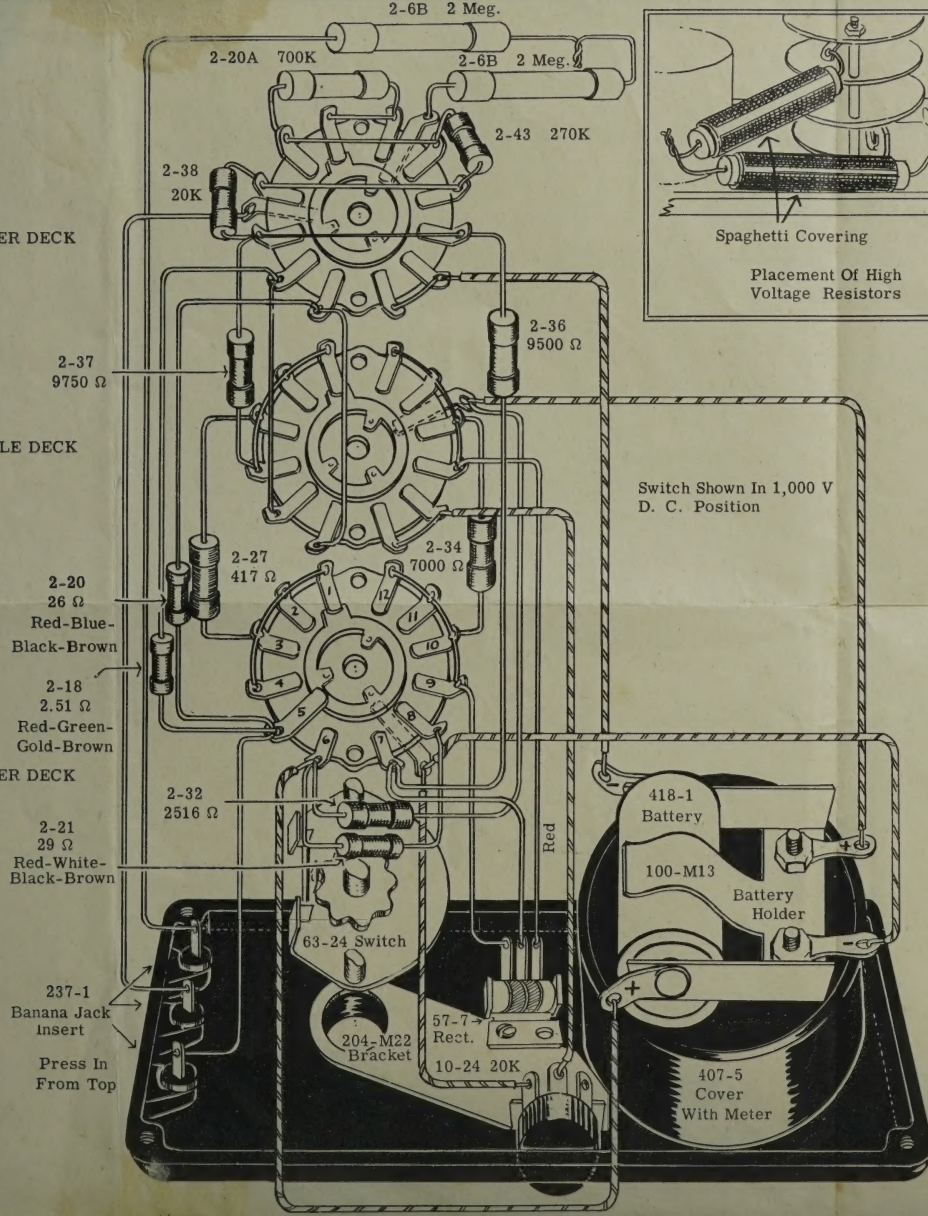
THE WORLD'S FINEST ELECTRONIC EQUIPMENT IN KIT FORM

BENTON HARBOR, MICHIGAN

UPPER DECK

MIDDLE DECK

LOWER DECK



Heathkit HANDITESTER KIT

MODEL M-1

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